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(71)Applicant : DAINIPPON INK & CHEM INC
(72)Inventor : INOUE FUMIYOSHI
SHIMIZU SEIICHI

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(54) COLOR TONER FOR FLASH FIXING AND ITS PRODUCTION

(57)Abstract:

PURPOSE: To inexpensively obtain sufficient fixing strength without clouding the colors of color toners by fixing an IR absorbent to the surfaces of toner particles prepd. by dispersing coloring agents into a resin.
CONSTITUTION: The IR absorbent absorbs the light energy of flash light and dissolves the binder resin from the surface when the flash light is cast to the toner fixing the IR absorbent on the surfaces of the toner particles. The sufficient fixing strength is thereby obtd. Since the IR absorbent is fixed to the surfaces, the IR absorbent does not peel from the toner even if the toner is used as a developer. There is thus no need for special consideration in ordinary use. The resulted color images do not cloud the colors. The binder resin is exemplified by resins, such as polystyrene and styrene and acrylate and is more preferably exemplified by epoxy resins, such as polyester resin and bisphenol A/epichlorhydrin.

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CLAIMS

[Claim(s)]

[Claim 1] The flash plate fixing toner for electrophotography characterized by the infrared-absorption agent having fixed on the front face of the toner particle which distributes a coloring agent and changes at least in a resin.

[Claim 2] The manufacture method of the flash plate fixing toner for electrophotography according to claim 1 characterized by consisting of the 2nd process to pulverize after supplying an infrared-absorption agent to the crushing object obtained at the 1st process which carries out crushing, and the 1st process after milling a coloring agent and a resin at least.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the color toner for electrophotography developers of an electro photographic printer for flash plate fixing which has a fixing method by flash plate light in more detail about the color toner for flash plate fixing in an electrophotography method.

[0002]

[Description of the Prior Art] The heat roll method which makes a toner stick to paper by pressure through between hot calender rolls from before as a picture fixing method to the printed matter-ed in an electro photographic printer, and the oven method which only lets heating oven pass and is fixed by the infrared radiation are used. However, these fixing methods were things with the danger of (2) fires that the pressure back will remain in paper which have the trouble of **, when a paper jam was caused in (1) fixing section. Therefore, development of the fixing method by the flash plate establishing method is furthered in recent years.

[0003] The flash plate establishing method is a method by which the coloring agent particle which is the component of a toner absorbs light with a powerful flash plate light, a temperature rise is momentarily carried out, the binder resin itself melts, and fixing is made by solidifying again after that.

[0004] The technology with which the technology which used the epoxy resin as a binding resin and used carbon and the color as a coloring agent used epoxy or polyester resin for the Provisional-Publication-No. No. 30139 [56 to] official report as a binding resin as a toner for electrophotography used for the flash plate establishing method, and used carbon for the publication-number No. 71276 [two to] official report as a coloring agent is indicated, respectively.

[0005]

[Problem(s) to be Solved by the Invention] When these toners for flash plate fixing electrophotography depend for the optical absorption on a coloring agent particle and color toners other than black tend to perform flash plate fixing, it must become poor establishing the rate of an optical absorption, and it must raise the power of flash plate fixing to a low sake more than double precision, or they must use other heat fixing meanses together, and will cause large-sized-izing of equipment, and many power consumption-ization. As a method of solving such a trouble, adding an infrared-absorption agent to a toner is proposed by JP,63-161460,A.

[0006] However, the color toner for flash plate fixing proposed by JP,63-161460,A is manufacturing three persons of a binder resin, a coloring agent, and an infrared-absorption agent by the method of only carrying out melting kneading. Although according to this manufacture method the infrared-absorption agent had to be added so much in order to obtain fixing intensity with a sufficient color toner since an infrared-absorption agent was kneaded also inside a toner particle, since coloring nature was in the infrared-absorption agent itself when an infrared-absorption agent is added so much and the fault and infrared-absorption agent of a color toner that a color becomes muddy were very expensive, there was a trouble that a toner price became high.

[0007] By lessening the addition of an infrared-absorption agent in a color toner, the technical problem which this invention tends to solve is cheap, and is to offer the color toner for flash plate fixing which can obtain sufficient fixing intensity, without making the color of a color toner muddy.

[0008]

[Means for Solving the Problem] In order that this invention persons may solve the above-mentioned technical problem, as a result of inquiring wholeheartedly, when flash plate light is applied to the toner which had fixed the infrared-absorption agent on the front face of a toner particle An infrared-absorption agent absorbs the light energy of flash plate light, a binder resin is melted from a front face, and sufficient fixing intensity is obtained, Since an infrared-absorption agent did not separate from a toner even if it used it as a developer, since the infrared-absorption agent was

fixed on the front face, about anticipated use, special consideration finds out not being needed and not making muddy the obtained color of a color picture, and came to complete this invention.
[0009] the flash plate fixing toner for electrophotography characterized by the infrared-absorption agent having fixed this invention on the front face of the toner particle which distributes a coloring agent and changes at least in (1) resin in order to solve the above-mentioned technical problem and (2) -- crushing is carried out after milling a coloring agent and a resin at least -- the 1st process [namely,] After supplying an infrared-absorption agent to the crushing object obtained at the 1st process, the manufacture method of the flash plate fixing toner for electrophotography the above-mentioned (1) publication characterized by consisting of the 2nd process to pulverize is offered.
[0010] Although resins, such as the copolymer system containing styrene with a polystyrene system, styrene, an acrylic ester or a methacrylic ester, acrylonitrile, or a maleate, a polyacrylic ester system, a polymethacrylic-acid-ester system, a polyester system, a polyamide system, an epoxy system, a phenol system, a hydrocarbon system, and a petroleum system, are mentioned as a binder resin used by this invention, epoxy resins, such as polyester resin, and bisphenol A/epichlorohydrin, are mentioned preferably. these resins are independent -- or although you may mix, the resin and additive of further others can also be used together
[0011] Pigments, such as a typical Magenta, cyanogen, and yellow, can be used as a coloring agent for color toners used by this invention. The operating rate of a coloring agent has the desirable range of 2 - 15 weight section to the binder 100 weight section.
[0012] The example of the Magenta color pigment which can be suitably used in this invention was shown in Table 1. Although it can be used even if independent, two or more sorts can also use these pigments, mixing.
[0013]
[Table 1]

C.I.No.	C.I.Pig.No.	顔料名	化学構造
１５８６５：３	R－４８－３	KET Red ３０５	アゾレーキ
１５８５０：１	R－５７－１	KET Red ３０６	アゾレーキ
１５８５０：１	R－５７－１	KET Red ３０７	アゾレーキ
１２３６０	R－３１	KET Red ３０８	アゾレーキ
７３９１５	R－１２２	KET Red ３０９	キナクリドン系

[0014] The example of the yellow color pigment which can be suitably used in this invention was shown in Table 2. Although it can be used even if independent, two or more sorts can also use these pigments, mixing.
[0015]
[Table 2]

C.I.No.	C.I.Pig.No.	顔料名	化学構造
２１１２７	Ｙ－８１	KET Yellow ４０１	不溶性ジスアゾ
－	Ｙ－１５４	KET Yellow ４０２	ベンズイミダゾロン
２１１０５	Ｙ－１７	KET Yellow ４０３	不溶性ジスアゾ
２１０９５	Ｙ－１４	KET Yellow ４０４	不溶性ジスアゾ
２１１００	Ｙ－１３	KET Yellow ４０５	不溶性ジスアゾ
２１０９０	Ｙ－１２	KET Yellow ４０６	不溶性ジスアゾ

[0016] The example of the cyano color pigment which can be suitably used in this invention was shown in Table 3. Although it can be used even if independent, two or more sorts can also use these pigments, mixing.
[0017]
[Table 3]

C.I.No.	C.I.Pig.No.	顔料名	化学構造
７４１６０	Ｂ－１５－６	KET Blue １０２	フタロシアニン系
７４１６０	Ｂ－１５	KET Blue １０３	フタロシアニン系
７４１６０	Ｂ－１５－３	KET Blue １０４	フタロシアニン系
７４１６０	Ｂ－１５－４	KET Blue １０５	フタロシアニン系
７４１６０	Ｂ－１５－４	KET Blue １０６	フタロシアニン系
－	Ｂ－６８	KET Blue １０７	フタロシアニン系

[0018] As an infrared-absorption agent used by this invention, "inter-record-gap-002" by Nippon Kayaku Co., Ltd., "IGR-003", etc. are mentioned, for example.
[0019] To the toner of this invention, a color and an electrification control agent can also be used together as a coloring agent.
[0020] As a color, for example C. -- I. solvent red 24 and C.I. solvent violet 13 and C.I. solvent blue 7 and C.I. solvent blue 35 and C.I. solvent green 35 and C.I. solvent Brown 5, C.I. solvent yellow 2, C.I. solvent yellow 14 and C.I. solvent - Orange 7 A C.I. solvent and C.I. solvent red The 3rd grade is mentioned.
[0021] An electrification control agent is classified into a right electrification control agent and a negative electrification control agent, and these electrification control agents have the desirable thing of colorlessness or light color. As a right electrification control agent, "BONTORON P-51" etc. by the Orient chemistry company is mentioned, for example. As a negative electrification control agent, the metal complex compound of the ester of a salicylic acid or a salicylic acid, and alkyl alcohol etc. is mentioned, and "BONTORON E-84" etc. by the Orient chemistry company is mentioned as such commercial elegance, for example.
[0022] Furthermore, when the toner layer imprinted by "the void of a fixing picture", i.e., paper, is fixed to the toner of this invention, in order to prevent generating of the phenomenon which a portion like the hole of sponge from which it escaped produces, a natural wax and a polyolefine system wax can also be used together.

[0023] As a natural wax, carnauba wax etc. is mentioned, for example.

[0024] As a polyolefine system wax, "screw call 660P" by Sanyo Chemical Industries, Ltd., "screw call 550P" (polypropylene wax), etc. are mentioned, for example.

[0025]

[Example] Hereafter, this invention is not limited by this although an example explains the flash plate fixing toner for electrophotography of a Magenta color. In addition, the "section" expresses the "weight section" among the following examples.

[0026] (Example 1)

"Poly sizer R32"

(Polyester resin by Dainippon Ink & Chemicals, Inc.) The 91 sections "First gene super Magenta R"

(Magenta color pigment by Dainippon Ink & Chemicals, Inc.) The five sections "BONTORON P-51"

(Right electrification control agent made from Orient Chemistry) The two sections "Screw call 660P"

(Polypropylene wax by Sanyo Chemical Industries, Ltd.) After carrying out heating kneading of the two sections, coarse grinding was carried out and the crushing object (SM-1) was obtained.

[0027] Next, in the crushing object "SM-1" 98 section, after carrying out injection mixture of the "inter-record-gap-003" 2 section (infrared-absorption agent made from Japanese Gunpowder), pulverization classification was carried out further and the Magenta toner (M-1) of 11.1 micrometers of mean particle diameters was obtained.

[0028] (Example 2)

"Epiclon 4050"

(Epoxy resin by Dainippon Ink & Chemicals, Inc.) The 46 sections "Epiclon 7050"

(Epoxy resin by Dainippon Ink & Chemicals, Inc.) The 45 sections "First gene super Magenta R" The five sections "BONTORON P-51" The two sections "Screw call 660P" After carrying out heating kneading of the two sections, coarse grinding was carried out and the crushing object (SM-2) was obtained.

[0029] Next, in the crushing object "SM-2" 98 section, after carrying out injection mixture of the "inter-record-gap-003" 2 section, pulverization classification was carried out further and the Magenta toner (M-2) of 10.8 micrometers of mean particle diameters was obtained.

[0030] (Example 1 of comparison)

"The poly sizer R32" The 89 sections "First gene super Magenta R" The five sections "BONTORON P-51" The two sections "Screw call 660P" The two sections "inter-record-gap-003" Carry out coarse grinding and carry out pulverization classification further, after carrying out heating kneading of the two sections. The Magenta toner (M-3) of 11.4 micrometers of mean particle diameters was obtained.

[0031] (Example 2 of comparison)

"Epiclon 4050" The 45 sections "Epiclon 7050" The 44 sections "First gene super Magenta R" The five sections "BONTORON P-51" The two sections "Screw call 660P" The two sections "inter-record-gap-003" Carry out coarse grinding and carry out pulverization classification further, after carrying out heating kneading of the two sections. The Magenta toner (M-4) of 11.0 micrometers of mean particle diameters was obtained.

[0032] (Example 3 of comparison)

"The poly sizer R32" The 87 sections "First gene super Magenta R" The five sections "BONTORON P-51" The two sections "Screw call 660P" The two sections "inter-record-gap-003" Carry out coarse grinding and carry out pulverization classification further, after carrying out heating kneading of the four sections. The Magenta toner (M-5) of 10.9 micrometers of mean particle diameters was obtained.

[0033] (Evaluation) Using the developer mixed at a rate of the toner 3 [various] section and the brown-iron-oxide carrier 100 section of 60-80 micrometers of mean particle diameters, negatives are developed with a commercial copying machine reconstruction machine, and a non-established picture is created. The external fixing testing machine of xenon-flash-tube loading made from USHIO Electrical and electric equipment performs flash plate fixing of the aforementioned non-established picture by 1J [/cm] 2 pulse. The result which performed evaluation of the fixing nature of a toner, a void, and a color tone was shown in Table 4.

[0034] x In addition, the fixing nature evaluation method was performed by the tape exfoliating method, made O 85% or more of survival rates of picture concentration, and carried out ** and 75% or less for 75 - 85%.

[0035] Survival-rate (%) =(picture concentration of picture concentration / first stage after tape exfoliation) x100.

[0036] To the color tone of a standard color, the color tone evaluation method is not somber, or viewing estimated it.

[0037]

[Table 4]

	トナー名	定着性	色調
実施例1	M－1	○	○
実施例2	M－2	○	○
比較例1	M－3	△	○
比較例2	M－4	△	○
比較例3	M－5	○	くすんだ色

[0038] Although the color tone of the toner M-3 of the example of comparison and M-4 was good, fixing nature became bad to the toner M-1 of this invention example and M-2 having good fixing nature and color tone, so that clearly from Table 4.

[0039] Moreover, although fixing nature was good, the toner M-5 of the example of comparison became the color in which the color tone was somber, and brought a result in which a toner property is inferior.

[0040]

[Effect of the Invention] Since the color toner for flash plate fixing of this invention had few additions of an infrared-absorption agent, and it ended and the infrared-absorption agent is wearing the toner front face, the light of a flash lamp is absorbed efficiently and outstanding fixing nature can be realized.

[Translation done.]